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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,523	01/07/2002	Kyung-Hyun Kim	SAM-0262	9107

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EXAMINER

GOUDREAU, GEORGE A

ART UNIT PAPER NUMBER

1763

DATE MAILED: 03/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/040,523

Applicant(s)

KIM, KYUNG-HYUN

Examiner

George A. Goudreau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on (1-02' to 11-03').
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 6, 9-11, 13-15 and 18 is/are rejected.
- 7) ☒ Claim(s) 2, 4, 7, 8, 12, 16 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Kondo (6,010,947).

Kondo discloses a process for fabricating an STI structure using the following steps:

- A pad SiO₂ layer (2) is formed onto the surface of the Si wafer (1).;
- A first stopper film (3) which is comprised of polysi is formed onto the surface of the pad SiO₂ layer (2).;
- A second stopper film (4) which is comprised of Si₃N₄ is formed onto the surface of the first stopper film.;
- A patterned photo resist etch mask (7) is used to pattern the Si₃N₄-polysi laminate.;
- The photo resist etch mask (7) is stripped from the surface of the wafer.;
- A oxide layer (9) is formed onto the sidewalls of the polysi layer.;
- A trench is etched into the pad SiO₂ layer (2) and the CZ-Si wafer.;
- A SiO₂ liner layer is conformably formed onto the surface of the wafer.;

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- A Si₃N₄ liner layer (10) is conformably formed onto the surface of the SiO₂ liner layer.;

- A FOX layer (6) is inherently used to planarize the surface of the wafer.;

- The FOX layer (6) is cmp planarized down to the surface of the second stop layer.;

- The second stop layer is selectively removed from the surface of the wafer.; and

- The first stop layer is selectively removed from the surface of the wafer.

This is discussed specifically in columns 7-10; and discussed in general in columns 1-12. This is shown specifically in figures 6-10; and shown in general in figures 1-13.

It would have been inherent the SiO₂ layer (6) which is used to planarize the surface of the wafer in the structure formed above forms a type of FOX. The examiner cites the case law listed below of interest to the applicant in this regard.

In re Swinehart (169 U.S.P.Q. 226 (CCPA)) and In re Best (195 U.S.P.Q. 430 (CCPA)) state that when an examiner has reasonable basis for believing that functional characteristics asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be inherent characteristics of the prior art, the examiner possesses the authority to require an applicant to prove that the subject matter shown to be in the prior art does not possess the characteristics relied upon.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 3, 5-6, 9, 13-15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo as applied in paragraph 2 above.

Kondo as applied in paragraph 2 above fail to disclose the following aspects of applicant's claimed invention:

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- the specific etch means which are claimed by the applicant for removing the removing the first stopper layer, the second stopper layer, and the gap filling oxide layer; and

- the specific etch process parameters which are claimed by the applicant

It would have been obvious to one skilled in the art to employ the specific etch processes which are claimed by the applicant for removing the various layers in the process taught above based upon the following. The usage of the specific etch means which are claimed by the applicant for removing the various layers in the process taught above is conventional or at least well known in the etching arts. (The examiner takes official notice in this regard.) Further, the usage of the specific etch means which are claimed by the applicant in the process taught above simply represents the usage of an alternative, and at least equivalent means for removing the layers in the process taught above to the specific usage of other such means.

It would have been prima facie obvious to employ any of a variety of different etch process parameters in any of the etching processes taught above (i.e.-the dry etch, the wet etch, or the cmp planarization step). These are all well known variables in the etching arts which are known to effect both the rate and quality of the etching process. Further, the selection of particular values for these variables would not necessitate any undo experimentation which would be indicative of a showing of unexpected results.

Alternatively, it would have been obvious to one skilled in the art to perform any of the etching processes taught above using the specific etch process parameters which are claimed by the applicant based upon *In re Aller* as cited below.

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"Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA).

Further, all of the specific etch process parameters which are claimed by the applicant are results effective variables whose values are known to effect both the rate, and the quality of the etching process.

6. Claims 2, 4, 7-8, 12, and 16-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner George A. Goudreau whose telephone number is (571)-272-1434. The examiner can normally be reached on Monday through Friday from 9:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Examiner Gregory Mills, can be reached on (571)-272-1439. The appropriate fax phone number for the organization where this application or proceeding is assigned is (703)-872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) -308-0661.


George A. Goudreau/gag

Primary Examiner/AU 1763